

Evolving Biosecurity Frameworks

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The idea that infectious disease may pose risks to society is not new and yet as the twenty-first century dawned the idea became a “hot” policy issue and academic topic. In part this was because the impact of disease upon society had been given a new framing – that of security. At the national and international level, governments who had hitherto felt able to absorb and/or respond to infectious disease outbreaks now perceived themselves as vulnerable to them, and consequently felt threatened by disease. Such perceptions stemmed in part from understandings that some disease burdens created social, political, economic and military consequences that had the ability to threaten the stability of states and regions. As a result, combating disease began to appear in national security strategies in countries such as the UK, France and the US. But how to respond to such insecurities were “up for debate, shifting across spatial, temporal and discursive contexts” (Baker et al, 2013, p5).

FRAMING DISEASE AS A SECURITY ISSUE

In the last decade of the twentieth century, particular concern began to be expressed that globalisation was facilitating the spread of infectious disease. In 1992 for example the US Institute of Medicine issued a report which warned “some infectious diseases that now affect people in other parts of the world represent potential threats to the United States because of global interdependence, modern transportation, trade and changing social and cultural patterns” (Lederberg et al, 1992, pv). Framing infectious disease in this way was part of a growing appreciation that a series of new security challenges, such as terrorism,

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drug trafficking, and environmental degradation, were supplanting the more traditional state centric national security concerns of the Cold War era. (Brower and Chalk, 2003) As remarked upon by James Woolsey during his nomination hearing for director of the Central Intelligence Agency in 1993: “In many ways today’s threats are harder to observe and understand . . . Yes, we have slain a large dragon, but now find ourselves living in a jungle with a bewildering number of poisonous snakes” (Woolsey, 1993, p76).

The intelligence community had first taken up the issue of the threat posed by infectious disease in the 1990s in relation to HIV/AIDS (CIA, 1991). However a declassified National Intelligence Estimate from January 2000 expanded the scope of diseases that might pose security concerns. The report noted, for example, that since 1973 at least thirty previously unknown diseases had been identified and at least twenty older infectious diseases had re-emerged or spread geographically over the same period frequently in drug resistant form. The authors of the report believed that “The spread of infectious diseases results as much from changes in human behaviour – including lifestyles and land use patterns, increased trade and travel, and inappropriate use of antibiotic drugs—as from mutations in pathogens” and suggested that,

new and re-emerging infectious diseases will pose a rising global health threat and will complicate US and global security over the next 20 years. These diseases will endanger US citizens at home and abroad, threaten US armed forces deployed overseas, and exacerbate social and political instability in key countries and regions in which the United States has significant interests. (NIC, 2000)

What prompted the release of this National Intelligence Estimate was the announcement by the then US Secretary of State Madeline Albright that the first UN Security Council session of the new millennium would be devoted exclusively to the threat to Africa from HIV/AIDS. Whilst this session is often remarked upon for ultimately leading to resolution 1308 on the *Responsibility of the Security Council in the Maintenance of International Peace and Security: HIV/AIDS and International Peace-keeping Operations*, it was the discussions within the session that did much to characterise the evolving nature of the relationship between infectious disease and security concerns. UN Secretary General Kofi Annan, for example, noted that the impact of AIDS in Africa was “no less destructive than that of warfare itself and by some measures it was far worse” and went on:

Nowhere else had AIDS become a threat to economic, social and political stability on the scale that it now was in Southern and Eastern Africa . . . In already unstable societies . . . that cocktail of disasters was a sure recipe for more conflict. And conflict, in turn, provided fertile ground for further infections. The breakdown of health and education services, the obstruction of humanitarian assistance, the displacement of whole populations and a high infection rate among soldiers . . . all ensured that the epidemic spread ever further and faster. (UNSC, 2000)

As President of the Security Council during this session, US Vice-President Al Gore noted that the links being articulated between HIV/AIDS and insecurity presented an opportunity to recast the work of the Security Council for the new century. With echoes of Woolsey's comments at his nomination hearing for CIA director seven years earlier, Gore is reported to have said that for the past 50 years the Security Council:

had dealt with a classic security agenda built upon common efforts to resist aggression, and to stop armed conflict. But while the old threats still faced the global community, there were new forces that now or soon would challenge the international order, raising issues of peace and war . . . includ[ing] the challenges of: the environment; drugs and corruption; terror; and new pandemics. (ibid)

Three months later, in April 2000, President Clinton took the unprecedented step of designating an infectious disease (AIDS) a threat to US national security (Gellman, 2000, pA01) Taken together, these actions signalled a “securitization” (Buzan et al, 1998) of infectious disease that resulted in greater political interest and access to larger economic resources so as to tackle to issue on a global scale. In line with the “securitization” thesis, political interest in HIV/AIDS has remained high and superior financial resources have indeed been accessed. This included US President George W. Bush promising \$15 billion over five years to international HIV/AIDS programmes in his 2003 State of the Union Speech. However, Selgelid and Enemark (2012) note that HIV/AIDS is a disease of attrition, meaning that “the effects of these diseases are relatively familiar and slow-acting, they do not concentrate the minds of people and politicians as readily as an unfamiliar and sudden outbreak crisis.” Consequently it was growing anxiety over a perceived new type of terrorist that may deliberately use infectious disease to further their aims which gave further salience to the relationship between infectious disease and security concerns.

THE BIOTERRORISM BUBBLE

The attacks on the World Trade Center and the Pentagon on 9/11 fundamentally altered perceived societal vulnerability towards terrorist use of infectious disease. Though the events themselves were quite unrelated to biological weapons (i.e. the hostile use of disease), the idea that non state actors, including terrorists, might seek to employ biological weapons to further their aims was lifted from (arguably) a niche concern to a mainstream security issue. Calling it niche is not to say that bioterrorism had not been considered a security threat prior to 2001 – many commentators had noted the potential (see for example Stern, 1993; Tucker, 1996, 2000; Moodie and Roberts, 1997; Smithson and Levy, 2000); table top exercises had been conducted, domestic preparedness programmes initiated (Guillemin, 2011, p7), and in countries such as the US, policy directives had been crafted that gave the highest priority to “developing

effective capabilities to detect, prevent, defeat and manage the consequences of nuclear, biological or chemical materials or weapons use by terrorists” (United States, 1995). However what the 9/11 attacks did was alter the global frame of reference about what terrorists writ large might now be prepared to undertake. The attacks appeared to suggest that what had been considered previously as restraining factors on terrorist actions, such as limiting casualties so as not to “risk of alienating the public especially their own supporters” were no longer valid (Butler, 2004, p30). Instead this new breed of terrorist and extremist appeared to want to cause casualties on a massive scale, and appeared undeterred by the fear of alienating the public, their own supporters, or indeed by considerations of personal survival.

After the sheer destructiveness of 9/11 Tucker (2001) notes that it was a logical next step for government officials to voice “fears that terrorists might unleash a devastating epidemic” as part of a second wave of attacks and in early October this hypothetical bioterrorism threat became a reality with the first death from inhalational anthrax in the US since 1976. Twenty-one others went on to be diagnosed with either inhalational or cutaneous forms of anthrax and five more people died. The source of the exposure was five letters containing anthrax spores anonymously posted to media outlets and members of the Senate. Coming so soon after the 9/11 attacks, these letters created a near hysterical atmosphere. Tucker writes:

Cable news networks hyped the bioterrorism threat with apocalyptic scenarios; postal workers sorted mail wearing rubber gloves and surgical masks; thousands of Senate staff members were put on prophylactic antibiotics; and letters addressed to government officials were irradiated with electron beams to kill lingering spores, delaying mail for weeks. Meanwhile, tens of thousands of ordinary Americans stockpiled ciprofloxacin (a potent antibiotic with potentially dangerous side effects), snapped up gas masks of questionable effectiveness from army supply stores and hoarded canned food and bottled water in anticipation of spreading epidemics and quarantines. (Tucker, 2001, p255)

Although the letters were only posted in the US, the anthrax letter attacks had global impact particularly because of the cognitive link that was made between biological weapons and the perpetrators of the 9/11 attacks.¹ In Europe for example, civil protection and security forces were put on alert, and public health systems had to deal with numerous items of mail containing powders suspected of being contaminated with anthrax. And at the political level, European countries acted at both the community level and national level. In October 2001 for example, the heads of state and government asked for a European level programme to be prepared to improve the cooperation between member states for the evaluation of risks, alerts, and intervention, and the collaboration in the field of research. At the national level many European countries re-examined their preparedness plans and strengthened or implemented new measures designed to prevent the misuse

of the biological sciences. This included placing restrictions on physical access to, and work performed with, certain pathogens labelled as “dangerous.”² European states were not alone in re-examining their preparedness programmes: in the US for example, at least three new pieces of legislation were enacted in quick succession aimed at preventing the misuse of disease and they significantly increased their investment in bio-defences, including medical countermeasures.³

At the international level, the threat from the deliberate spreading of disease slotted neatly into the global “war on terror” that President Bush had launched in the days following 9/11. Addressing the United Nations General Assembly in November 2001 Bush described terrorists as

searching for weapons of mass destruction, the tools to turn their hatred into holocaust. They can be expected to use chemical, biological and nuclear weapons the moment they are capable of doing so. No hint of conscience would prevent it. This threat cannot be ignored. This threat cannot be appeased. Civilization, itself, the civilization we share, is threatened. (Bush, 2001)

Consequently the global community also acted together to combat the threat from bioterrorism. This included a range of activities including “operational” initiatives such as the Proliferation Security Initiative, the G8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction and the Global Health Security Initiative⁴ as well as broadening the mandate of international organisations such as the World Health Organisation such that they now had a role in responding to the “natural occurrence, accidental release or deliberate use of biological and chemical agents or radionuclear material that affect health.” (WHA, 2002) At the diplomatic level, the work of the 1972 Biological Weapons Convention (BWC) now became focused on a broadened understanding of the threat posed by biological weapons, including the possibility of terrorist use of biological agents. The focus prior to 2001 had been state level adherence to the norms of the BWC. However if properly implemented at the national level, the Convention addresses potential terrorist use by transferring the obligations that states agree to – not to develop, produce, manufacture or stockpile biological and toxin weapons or methods of delivery of such weapons – onto individuals in their territory or under their jurisdiction anywhere. When tabling a number of proposals for future work in late 2001 the US delegation noted that “many of these ideas will bear little resemblance to the traditional arms control measures of the past” including the negotiation of a legally binding verification protocol which had recently failed (US Department of State, 2001). These alternative proposals eventually initiated an “intersessional process” where states parties to the BWC meet twice yearly to discuss, promote common understanding and achieve effective action on a number of topics related to this broadened understanding of biological threats.⁵

SARS AND THE FURTHER INTERTWINING OF DISEASE AND SECURITY CONCERNS

Viewed within the bioterrorism/war on terror framing, the political significance of mitigating naturally occurring disease outbreaks was elevated by linking global health engagement with set of efforts to counter violent extremism and bring stability to conflict-prone areas (Chreiten, 2011). Consequently, much of the engagement that took place was therefore focused on Africa as home to a number of fragile states with porous borders and groups linked to Al Qaeda.

Concurrent with this terrorism-focused framing of the threats posed by infectious disease, another more human security focused framing of disease was forwarded in documents such as the 2004 *United Nations High Level Panel on Threats Challenges and Change* where the challenges of disease were presented as follows:

The security of the most affluent State can be held hostage to the ability of the poorest State to contain an emerging disease. Because international flight times are shorter than the incubation periods for many infectious diseases, any one of 700 million international airline passengers every year can be an unwitting global disease-carrier. (Anan, p14)

Part of the stimulus for framing of the threats from infectious disease as “without borders” came from the experiences of the 2003 severe acute respiratory syndrome (SARS) outbreak. The sudden appearance of SARS had, by the time the World Health Organisation (WHO) declared the outbreak contained in July 2003, spread to 27 countries on all continents, infected more than 8000 people and presented an 11% lethality rate. (WHO, 2004) Unlike the apocalyptic “dread risk” scenarios for bioterrorism attacks in the same period, SARS was a “dread reality”: evidence showed SARS to be a fast spreading disease that did not require a vector; symptoms appeared to begin an average of four days after exposure to an infected person and mimicked many common diseases – high fever, a dry cough and shortness of breath (WHO, 2007) and the disease showed no particular geographical affinity. Indeed on this last point an association was made early on between SARS and travel on commercial airlines (see for example Olsen et al, 2003) which resulted in guidelines being issued regarding travel to and from areas affected by SARS that focused on hand hygiene and specified that anyone suspected of having SARS should wear a facemask. However, public perception of the risk of becoming infected with SARS led to widespread use of facemasks whether on a flight or not (see for example Hesketh, 2003, p1095).

Fear of infection was therefore a potent ingredient in the SARS epidemic: in Toronto, Canada, there were reports of “public bus drivers using face masks on routes near Chinese communities and empty seats surrounding Chinese university students” (Schram, 2003, p939) and at the height of the epidemic,

despite only eight people in the US having laboratory evidence of SARS, Eichelberger (2007) notes that 14% of Americans reported avoiding Asian businesses. Indeed across the US “restaurants, travel agencies and other businesses from New York to San Francisco [reported] customer traffic is down by 60% or more” (Hopkins, 2003).

As with the anthrax letters then, the effects of the SARS epidemic were not confined to ill health, or to those countries directly affected. Indeed, it was the economic repercussions of the outbreak that came to define the disease. One assessment for example, estimated the total cost of the epidemic to the Asian regional economy at US\$20 billion in gross domestic product for 2003, “that is, over US\$2 million per person infected by SARS,” with gross expenditure and business losses being estimated as high as US\$ 60 billion (Rossi and Walker, 2005 p2-3) The authors also note that this was a shared economic burden whether the country reported infections or not because of the association between airline travel and infection. This is because as Elbe (2010) notes the travel and tourism sectors in the region were heavily affected with “room and airline seat bookings to [the region] down in several cases by more than 50 per cent compared to previous years.”

Any lingering doubts about whether the trans-border spread of infectious diseases created security issues were removed by the SARS outbreak. SARS also drew attention to potential security implications of a wider set of emerging and re-emerging infectious diseases that could no longer be ignored. Indeed quickly on the heels of SARS epidemic, concern began to be expressed over the pandemic potential of H5N1 avian influenza. Sensitised to the potential of an influenza A type pandemic by the 2003 outbreak of H5N1, or “bird flu,” fear was now being expressed that H5N1 could mutate or combine with a human influenza virus to form a new virus, capable of sustained human-to-human transmission (see for example Lee and Fidler, 2007 and WHO, 2009). Writing in the *New York Times* members of the Senate Committee on Foreign Relations, Barak Obama and Richard Lugar, framed the relationship between national security and an influenza pandemic as follows:

When we think of major threats to our national security the first to come to mind are nuclear proliferation, rogue states and global terrorism. But another kind of threat lurks beyond our shores, one from nature not humans – an avian flu pandemic. An outbreak could cause millions of deaths, destabilize Southeast Asia . . . and threaten the security of governments around the world (Obama and Lugar, 2005)

What H5N1 did, Elbe (2010) notes, was render the mere possibility of a future outbreak a sufficient condition for considering an infectious disease as a threat to security and so requiring investment and proactive pandemic preparedness. Indeed in January 2006, the international community pledged US\$1.9 billion to fight avian influenza and prepare for a possible human pandemic (Beijing Declaration, 2006).

The UN High Level Panel report quoted above also alludes to another vulnerability that was exposed during the SARS outbreak, namely the deficiencies in the contemporary reporting system for infectious disease outbreaks. At the time, the WHO was prevented from responding to an outbreak until it had received official reports from governments (Heymann, 2004). In the case of SARS, there was a three-month delay from onset until the WHO received official reports from the Chinese Ministry of Health by which time there were over 300 cases and the disease had spread to five countries.

Part of the inadequacy of that reporting system was the mismatch between the framework under which the WHO had to work, the 1969 International Health Regulations, and the tools that the WHO had at its disposal in 2003. For example the WHO were unable to act despite having “epidemic intelligence networks” such as the Global Outbreak Alert and Response Network (GOARN) in place at the time of the SARS outbreak that had picked up on an outbreak prior to the official notification. This intelligence had been gathered by GOARN’s early warning element which collects and verifies reports and rumours of epidemics from a wide variety of unofficial sources, including nongovernmental organisations, news media, electronic discussion groups such as the Program for Monitoring Emerging Diseases, and other official surveillance networks. When the WHO was eventually able to act, the response side of GOARN was activated and within a period of weeks after the first recognised case, a virtual network of eleven leading infectious disease laboratories in nine countries had been established. Connected by a secure website and daily teleconferences, the laboratories collaborated to identify the causative agent of SARS and to develop a diagnostic test; similar groups were also created to pool clinical knowledge and compare epidemiological data on SARS (Knobler et al, 2004). The WHO used this information to make recommendations on patient management which included issuing travel recommendations in an attempt to curb, and eventually stop, the international spread of this newly recognised virus (Heymann, 2004).

REVISING THE INTERNATIONAL HEALTH REGULATIONS

Perhaps the most important legacy of the SARS epidemic, and to a lesser extent the H5N1 outbreak, was the sense of urgency it gave to finalising the updates to the 1969 International Health Regulations (IHRs). Begun in the mid-1990s, the revision process had two primary goals: to make use of modern communication technologies to understand where diseases were occurring and had the potential to spread, and to change the international norm for reporting infectious disease outbreaks so that countries were not only expected to report outbreaks, but also respected for doing so (Heymann, 2010) The updates were completed in 2005 and went into effect in 2007.

Amongst the many updates, the establishment of a global surveillance system for public health emergencies was critical. Surveillance is defined in the revised IHRs as “the systematic on-going collection, collation and analysis

of data for public health purposes and the timely dissemination of public health information for assessment and public health response as necessary” (WHO, 2008). The surveillance system operates from the local to the global level. At the national level each state party is now required to notify WHO of “all events which may constitute a public health emergency of international concern” including any unexpected or unusual public health event regardless of its origin or source and also requires state parties, as far as is practicable, to inform the WHO of public health risks identified outside their territories that may cause international disease spread. To assist in compliance with this obligation, the 2005 IHRs defines a public health emergency of international concern (PHEIC) as

an extraordinary event which is determined [by the WHO Director-General] . . . (i) to constitute a public health risk to other States through the international spread of disease and (ii) to potentially require a coordinated international response. (ibid)

and defines disease as

an illness or medical condition irrespective of origin or source, that presents or could present significant harm to humans that does or could threaten human health. (ibid)

A decision-tree to assist state parties in defining whether a health related event is a PHEIC is included, so too a list of diseases for which a single case may constitute a PHEIC and so must be reported to the WHO immediately. This list consists of smallpox, poliomyelitis, human influenza caused by new subtypes, and SARS.

Arguably, as a direct result of perceived reluctance on the part of the Chinese authorities to be transparent in the early stages of the SARS outbreak, the revised IHRs state that the WHO can collect, analyse and use information “other than notifications or consultations” including from intergovernmental organisations, nongovernmental organisations and actors, and the Internet. Furthermore the WHO can now act upon the information gathered by requesting “verification from the State Party in whose territory the event is allegedly occurring.” When so requested, the state party has 24 hours to give an initial reply to the WHO, or acknowledge the request from them, and if possible provide the WHO with available information on the status of the event referred to in the request. This is done through the newly required national focal point for the IHRs, a role established to ease communication between the WHO and the state party.

In permitting the WHO to act upon that information and requiring states to perform some form of action within 24 hours of that request, the principle of national sovereignty became subordinate to the collective interests of global disease surveillance. This had stalled the revision process, but as Katz and

Fischer (2010) note the “sudden fear of the consequences of a single nation’s failure to report an emerging infection – whether due to lack of will or capacity – overcame many of the concerns about sovereignty.”

Although nowhere in the revised IHRs is the word “intentional” or “deliberate” used the scope of the definition of disease within the revised IHRs and the newly expanded role of the WHO with regard to deliberate disease outbreaks mean that the IHRs do encompass communicable and non-communicable disease events, whether naturally occurring, accidentally caused, or intentionally created. In part, this is because whether deliberate, accidental or naturally occurring, the initial response to the outbreak would be the same, meaning that early warning systems, indeed in general strong public health systems, serve multiple purposes.

IMPLEMENTING THE REVISED INTERNATIONAL HEALTH REGULATIONS

At the time of writing the IHRs have been in force for nine years and there have been four declared public health emergencies of international concern, including the 2013 Ebola virus outbreak in West Africa, declared a PHEIC on 8 August 2014. Between March 2014, when the outbreak was first reported, and 29 March 2016 when the the WHO Director-General declared the PHEIC at an end the total number of reported cases in the three worst affected countries (Guinea, Liberia and Sierra Leone) was 28,646.⁶ A small number of cases were also reported in Nigeria and Mali and a single case reported in Senegal; however, these cases were contained, with no further spread in these countries. In addition there were a small number of exported cases in Spain (1 case); the United States (4 cases); the United Kingdom (1 case) and Italy (1 case).

A review of WHO’s response to this Ebola outbreak characterised it as “the most complex outbreak on record... [which] devastated families and communities, compromised essential civic and health services, weakened economies... isolated affected populations... [and] put enormous strain on national and international response capacities, including WHO’s outbreak and emergency response structures” (WHO, 2015). Indeed, the strain was such that the international response to the outbreak included the establishment of the first ever United Nations emergency health mission, the United Nations Mission for Emergency Ebola Response or UNMEER, after the unanimous adoption of General Assembly resolutions 69/1 and 69/3, and the adoption of Security Council resolution 2177 (2014) on the Ebola outbreak.

Whilst the idea that health issues and security are linked was by now firmly embedded within the international political consciousness and that response to outbreaks were considered both a national and international responsibility, the Ebola outbreak served to highlight a significant mismatch between those ideas and practical realities. The review of the WHO’s response noted above was extremely critical of the response effort on a number of levels. Regarding the actions of the WHO itself, the panel’s assessment regarded there to have been “significant and unjustifiable delays” in declaring the Ebola outbreak a public

health emergency of international concern, despite early warnings about the outbreak from its own staff and from non governmental organisations such as Médecins Sans Frontières, and that the “WHO does not currently possess the capacity or organizational culture to deliver a full emergency public health response” (WHO, 2015, p6). Part of the reason for this is that there are no core funds for emergency response and the panel recommended the immediate creation of a contingency fund in support of outbreak response as well as the establishment of a WHO Centre for Emergency Preparedness and Response which would develop the necessary new structures and procedures to achieve full preparedness and response capacity.

Considering the outbreak in terms of the revised IHRs, the panel also noted that nearly a quarter of WHO’s Member States “in violation of the Regulations,” instituted travel bans and other additional measures not called for by WHO, “which significantly interfered with international travel, causing negative political, economic and social consequences for the affected countries” (ibid, p5). The panel went on to say that they consider the situation “in which the global community does not take seriously its obligations under the International Health Regulations (2005) – a legally binding document – to be untenable” (ibid).

Implementation statistics for the revised IHRs do indeed demonstrate that many states have had difficulties in implementing what is required of them in this new system. All states were to have the new national core surveillance capabilities in place by June 2012; however, by that deadline less than 20% of the 194 WHO member states – that is 42 states – reported they had achieved the core capacities; 110 countries requested and obtained an additional two year extension and 42 countries neither submitted an extension request nor indicated that they are in compliance (Katz and Fischer, 2013, p153). At the end of the second two-year extension period the WHO Executive Board noted that only an additional 22 states (64 nations in total) reported that they had fully implemented the revised IHRs (World Health Organisation, 2015).

In part to redress these implementation difficulties, the US in partnership with about 30 other countries, IOs, NGOs and public/private enterprises launched the Global Health Security Agenda (GHSA) in February 2014. The GHSA has 11 discrete action packages under the three cluster heading of “prevent, detect and respond” covering issue areas such as antimicrobial resistance, zoonotic diseases, real time surveillance and reporting. Eight of these packages relate in whole to the revised IHRs and a package is also specifically dedicated to improving biosafety and biosecurity systems and preventing bioterrorism.⁷

CONCLUDING THOUGHTS

The spectrum of issues being addressed by the Global Health Security Agenda reflects the evolution of biosecurity issues since the end of the Cold War. What had previously been considered as two separate domains – public health and national security – have now become merged to create a spectrum of biosecurity issues that

encompasses naturally occurring incidents, accidental outbreaks and deliberate use of infectious disease. This intertwining is reflected in both domains: in the public health domain, the WHO for example had its mandate extended to include responding to deliberate use of biological agents and in the traditional arms control arena, states parties to the Biological Weapons Convention are creating synergistic relations with public health organisations to further their aims of mitigating the effects of a deliberate use should it occur. In addition, the Global Health Security Agenda also reflects a change in views regarding responsibility for responding to this spectrum of biosecurity issues: whereas in 2000 the Security Council viewed HIV/AIDS as posing a threat to a geographically defined area, the SARS outbreak in 2003 and the potential of an influenza pandemic shortly thereafter illustrated the truly global interconnected nature of the threat and so the shared international responsibility of responding to them. To use an argument put forward by Andrew Lakoff and Stephan Collier (2008), the issue for the future is not *whether* a disease outbreak can be characterised as a biosecurity threat which requires attention but what *kind* of biosecurity problem does it present, what kind of techniques are used to assess them and what is the most appropriate kinds of responses.

NOTES

1. On this see for example Central Intelligence Agency, Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction, 1st July-31st December 2003. Available at https://www.cia.gov/library/reports/archived-reports-1/july_dec2003.htm#chemical.
2. For example: In the UK, the 2001 *Anti-Terrorism Crime and Security Act*, created a list of “dangerous” pathogens which required additional security requirements and access restrictions. In addition, the Secretary of State now had to be informed of any premises where any dangerous substances was kept and used.
3. In addition to political action, the scientific community also responded to the perceived heightened vulnerability, especially addressing what actions they might take to support national efforts to prepare against deliberate attacks using disease and what actions they needed to take to prevent their work from being deliberately misused and contributing to the development of biological weapons. For more on this see McLeish C (2006) “Science and censorship in an age of bio-weapons threat” *Science and Culture* 15:3, 215–236; McLeish C and P Nightingale (2007) “Biosecurity, bioterrorism and the governance of science: The increasing convergence of science and security policy”, *Research Policy* 36 (2007) 1635–1654.
4. For more information on these initiatives see <http://www.psi-online.info>; <http://www.nti.org/treaties-and-regimes/global-partnership-against-spread-weapons-and-materials-mass-destruction-10-plus-10-over-10-program/> and <http://www.ghsi.ca/english/index.asp>.
5. At the time of writing three such intersessional processes have been completed which have focused on topics as diverse as strengthening national implementation of the Convention; assistance and cooperation in the events of a biological weapons attack; reviewing relevant developments in science and technology; and awareness

raising efforts amongst scientists. For more information on the Biological Weapons Convention and the intersessional process see www.unog.ch/bwc.

6. Part of the reason for the unprecedented scale of the outbreak was its spread to urban centres including the capital cities of the three worst affected countries. All case figures are taken from <http://apps.who.int/ebola/current-situation/ebola-situation-report-30-march-2016>.
7. For more on the Global Health Security Agenda see <https://www.whitehouse.gov/the-press-office/2014/09/26/fact-sheet-global-health-security-agenda-getting-ahead-curve-epidemic-th>.

BIBLIOGRAPHY

- Anan K (2004) 'Foreword' *A more secure world: our shared responsibility* United Nations High Level Panel on Threats Challenges and Change.
- Baker K S Taylor and A Dobson (2013) "'Interrogating Bio-Insecurities'", In K Baker S Taylor and A Dobson (eds.) *Biosecurity: The Socio-Politics of Invasive Species and Infectious Diseases*, London: Routledge.
- Brower J and P Chalk (2003) *The Global Threat of New and Re-Emerging Infectious Diseases: Reconciling US National Security and Public Health Policy*, Santa Monica, CA: RAND.
- Butler R (2004) *Review of Intelligence on Weapons of Mass Destruction, Report of Committee of Privy Counsellors*, London: The Stationary Office. HC898, 14th July.
- Buzan, B O Waever and J De Wilde (1998) *Security a New Framework for Analysis*, Boulder, Colo: Lynne Rienner Publishers.
- Chretien J-P (2011) "US Military Global Health Engagement since 9/11: Seeking Stability through Health", *Global Health Governance*, IV(2) Spring.
- CIA (1991) 'The global AIDS disaster', *Interagency Intelligence Memorandum 91-10005*, Washington DC.
- CIA (2003) *Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction, 1st July-31st December 2003*, Available at https://www.cia.gov/library/reports/archived-reports-1/july_dec2003.htm#chemical.
- Eichelberger L (2007) "SARS and New York's Chinatown: The Politics of Risk and Blame During an Epidemic of Fear", *Social Science & Medicine*, 65(6), pp. 1284–1295.
- Elbe S (2010) "Pandemic Security", In Burgess J P (ed.) *Handbook of New Security Studies*, London: Routledge.
- Franco C and T Kirk Sell (2010) "Federal Agency Biodefense Funding", *Biosecurity and Bioterrorism, Biodefense Strategy, Practice and Science*, 8(2), pp. 129–149.
- Gellman B (2000) "AIDS Is Declared Threat to Security: White House Fears Epidemic Could Destabilize World," *Washington Post*, 30th April.
- Guillemin J (2011) *American Anthrax*, New York: Henry Holt and Company.
- Hesketh T (2003) "China in the Grip of SARS", *BMJ*, 326, p. 1095.
- Heymann D (2004) "The International Response to the Outbreak of SARS in 2003", *Philosophical Transactions*, 359(1447), pp. 1127–1129.
- Heymann D (2010) "Communicating Disease Risk: Then and Now", Institute of Medicine (US) Forum on Microbial Threats, *Infectious Disease Movement in a Borderless World: Workshop Summary*, National Academies Press, Available at <http://www.ncbi.nlm.nih.gov/books/NBK45725/>.

- Hopkins J (2003) "SARS Scare Hurts Business in Chinatowns", *USA Today*, 24th April, Available at http://usatoday30.usatoday.com/news/nation/2003-04-24-chinatown-usat_x.htm.
- International Pledging Conference on Avian and Human Pandemic Influenza (2006) Beijing, Available at http://www.cdc.gov/onehealth/pdf/beijing/beijing_declaration.pdf.
- Katz R and J Fischer (2010) "The Revised International Health Regulations: A Framework for Global Pandemic Response", *Global Health Governance*, III(2), p. 18. Available at <http://ghgj.org/Volume%20III%20Issue%202.htm>.
- Katz R and J Fischer (2013) "Moving Forward to 2014: Global IHR (2005) Implementation", *Biosecurity and Bioterrorism: Biodefense Strategy, Practice and Science*, 11(2), pp. 153–156.
- Knobler S A Mahmoud S Lemon (2004) "Learning from SARS: Preparing for the Next Disease Outbreak: Workshop Summary", In Knobler S A Mahmoud and S Lemon (eds.) *The Public Health Response to SARS*, Institute of Medicine, Forum on Microbial Threats, Washington DC: National Academies Press, Available at <http://www.ncbi.nlm.nih.gov/books/NBK92460/>.
- Lakoff A and S Collier (2008) "The Problem of Securing Health", In Lakoff A and S Collier (eds.) *Biosecurity Interventions: Global Health and Security in Question*, New York: Columbia University Press.
- Lederberg J R Shope and S Oaks (eds) (1992) *Emerging Infections: Microbial Threats to Health in the United States*, Committee on Emerging Microbial Threats to Health, Division, Institute of Medicine, Washington DC: National Academies Press.
- Lee K and D Fidler (2007) "Avian and Pandemic Influenza: Progress and Problems with Global Health Governance", *Global Public Health: An International Journal for Research, Policy and Practice*, 2(3), pp. 215–234.
- McLeish C (2006) "Science and Censorship in an Age of Bio-Weapons Threat", *Science and Culture*, 15(3), pp. 215–236.
- McLeish C and P Nightingale (2007) "Biosecurity, Bioterrorism and the Governance of Science: The Increasing Convergence of Science and Security Policy", *Research Policy*, 36, pp. 1635–1654.
- Moodie M and B Roberts (eds) (1997) *Terrorism with Chemical and Biological Weapons: Calibrating Risks and Responses*, Alexandria, Va: Chemical and Biological Arms Control Institute.
- National Intelligence Council (2000) *The Global Infectious Disease Threat and Its Implications for the United States*, Available at <http://fas.org/irp/threat/nie99-17d.htm>.
- Obama B and R Lugar (2005) "Grounding a Pandemic", *The New York Times*, 6th June.
- Olsen S J H-L Chang T Y-Y Cheung A F-Y Tang T Fisk S P-L Ooi H-W Kuo D D-S Jiang K-T Chen J Lando K-H Hsu T-J Chen and S Dowell (2003) "Transmission of the Severe Acute Respiratory Syndrome on Aircraft", *New England Journal of Medicine*, 349, pp. 2416–2422.
- Remarks by President Bush to United Nations General Assembly, November 9th 2001, Available at <http://georgewbushwhitehouse.archives.gov/news/releases/2001/11/20011110-3.html>.

- Rossi V and J Walker (2005) *Assessing the Economic Impact and Costs of Flu Pandemics Originating in Asia*, Oxford: Oxford Economic Forecasting Group. May.
- Schram J (2003) "How Popular Perceptions of Risk from SARS are Fermenting Discrimination", *BMJ*, 326, p. 939. Available at <http://www.bmj.com/content/326/7395/939.1>.
- Selgelid M and C Enemark (2012) "HIV/AIDS, Security and Ethics", In Enemark C and M Selgeild (eds.) *Ethics and Security Aspects of Infectious Disease Control: Interdisciplinary Perspectives*, Farnham: Ashgate.
- Smithson A and L Levy (2000) *Ataxia: The Chemical and Biological Terrorism Threat and the U.S. Response*, Stimson Report no. 35 Washington, DC: Henry L. Stimson Center, October.
- Stern J (1993) "Will Terrorists Turn to Poison?", *Orbis*, 37(3) Summer, pp. 393–410.
- Tucker J (1996) "Chemical/Biological Terrorism: Coping with a New Threat", *Politics and the Life Sciences*, 15(2) September, pp. 167–184.
- Tucker J (2000) *Toxic Terror: Assessing Terrorist Use of Chemical and Biological Weapons*, Cambridge, Mass: MIT Press.
- Tucker J (2001) *Scourge: The Once and Future Threat of Smallpox*, New York: Grove Press.
- United Nations General Assembly resolution 69/1 (2014) *Measures to Contain and Combat the Recent Ebola Outbreak in West Africa*, 19th September, Available at http://www.un.org/en/ga/search/view_doc.asp?symbol=A/69/PV.3.
- United Nations General Assembly resolution 69/3 (2014) *United Nations Mission for Ebola Emergency Response*, 9th October, Available at http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/69/3.
- United Nations Press Office (2000) *UN Security Council Holds Debate on Impact of AIDS on Peace and Security in Africa*, Press Release, 10th January, Available at <http://www.un.org/press/en/2000/20000110.sc6781.doc.html>.
- United Nations Security Council resolution 1308 (2000) On the Responsibility of the Security Council in the Maintenance of International Peace and Security: HIV/AIDS and International Peace-Keeping Operations, July, Available at http://data.unaids.org/pub/BaseDocument/2000/20000717_un_seresolution_1308_en.pdf.
- United Nations Security Council resolution 2177 (2014) *Peace and Security in Africa*, 18th September, Available at http://www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/2177%20 (2014).
- United States (1995) *Presidential Decision Directive NSC-39*, Washington DC: The White House, June 21st, Available at <http://fas.org/irp/offdocs/pdd/pdd-39.pdf>.
- United States Department of State (2001) *New ways to strengthen the inter-national regime against biological weapons. Fact sheet*, 19 October
- Woolsey J (1993) Nomination Hearing before the Senate Select Committee on Intelligence, 2-3 February.
- World Health Assembly (2002) Resolution WHA55.16, *Global Public Health Response to Natural Occurrence, Accidental Release or Deliberate Use of Biological and Chemical Agents or Radio nuclear Material that Affect Health*, May 18th, Available at http://apps.who.int/gb/archive/pdf_files/WHA55/ewha5516.pdf.

- World Health Organization (2004) *Summary of probable SARS cases with onset of illness from 1 November 2002 to 31 July 2003*. Geneva: World Health Organization, April, Available at http://www.who.int/csr/sars/country/table2004_04_21/en/.
- World Health Organization (2007) *World Health Report 2007 Global Public Health Security in the twenty first century*, Geneva: World Health Organization, Available at http://www.who.int/whr/2007/07_chap3_en.pdf.
- World Health Organization (2008) *International Health Regulations (2005)*, Geneva: World Health Organization.
- World Health Organization (2009) *Pandemic Influenza Preparedness and Response: A WHO Guidance Document*, Geneva: World Health Organization.
- World Health Organization (2015) *Report of the Ebola Interim Assessment Panel*, July, Available at <http://www.who.int/csr/resources/publications/ebola/ebola-panel-report/en/>.
- World Health Organization Executive Board (2015) *Implementation of the International Health Regulations (2005)*, 136th Session, EB136/22 Add.1, 16th January, Available at http://apps.who.int/gb/ebwha/pdf_files/EB136/B136_22Add1-en.pdf.

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